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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,447	06/19/2006	Masahito Furukawa	125757	9002
25944 7590 06/27/2008 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER				
KOSLOW, CAROL M				
ART UNIT		PAPER NUMBER		
1793				
MAIL DATE		DELIVERY MODE		
06/27/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/583,447

**Applicant(s)**

FURUKAWA ET AL.

**Examiner**

C. Melissa Koslow

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date 6/19/06
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

The disclosure is objected to because of the following informalities:

The phrase "...element including at least niobium selected from the group consisting of niobium and tantalum" uses improper Markush terminology. The correct wording, under U.S. practice is "...element includes niobium and optionally tantalum", or similar terminology. The specification refers to the "long form of the period table". It is unclear what is meant by this since it is not how the Periodic Table is conventionally referred to in the U.S. Appropriate correction is required.

Claims 1, 5, 7 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 5 and 10 are indefinite since the phrase "...element including at least niobium selected from the group consisting of niobium and tantalum" uses improper Markush terminology. The correct wording, under U.S. practice is "...element includes niobium and optionally tantalum", or similar terminology. Claim 7 refers to the "long form of the period table". This claim is indefinite because it is unclear what is meant by this since it is not how the Periodic Table is conventionally referred to in the U.S.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 02/102738 in combination with U.S. patent 6,093,339.

U.S. patent 7,309,450 is the national stage application for WO 02/102738 and thus it is the English translation for WO 02/102738.

WO 02/102738 teaches a piezoelectric ceramic comprising a perovskite oxide having the formula  $(\text{Na}_{1-x-y}\text{K}_x\text{Li}_y)(\text{Nb}_{1-w}\text{Ta}_w)\text{O}_3$ , less than 10 mol% of an alkaline earth titanate and 5.3 mol% or less of a tungsten bronze oxide, where  $0 < x < 1$ , preferably  $x = 0.1-0.9$ ;  $0 \leq y < 1$ , preferably  $0 \leq y < 0.2$  and  $0 \leq w < 1$ . The tungsten bronze has the formula  $\text{M}(\text{Nb}_{1-v}\text{Ta}_v)_2\text{O}_6$ , where M is an alkaline earth and v is 0-1. The reference teaches the ceramic contains at least one sub-component selected from oxides of elements of Group 3 to Group 12 of the Periodic Table, such as MnO and combinations of MnO and at least one of oxides of Fe, Co, Ni and Zn, where the amount of each subcomponent is 0.01-1 wt%. The ceramic is produced by calcining a mixture of the precursors for the taught oxides. This reference suggests all the claimed limitations except it teaches an alkaline earth titanate instead of the claimed alkaline earth zirconate. The amounts all overlap and/or fall within those claimed. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). Also see MPEP 2144.05. U.S. patent 6,093,339 teaches a piezoelectric ceramic comprising a perovskite oxide having the formula  $(\text{Na}_{1-x-y}\text{K}_x\text{Li}_y)(\text{Nb}_{1-w}\text{Ta}_w)\text{O}_3$  and 10 mol% or less of a perovskite oxide having the formula  $\text{MQO}_3$ , where M is an alkaline earth element and Q is Ti, Zr, Sn or Hf. The examples show that there is not much difference in the properties of the ceramic containing a titanate and one containing a zirconate. Thus it appears that in niobate based piezoelectric ceramics, alkaline earth titanates and zirconates are functionally equivalent. Therefore one of ordinary skill in the

Art Unit: 1793

art would have found it obvious to replace the taught alkaline earth titanates in the ceramic of WO 02/102738 with an alkaline earth zirconate because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of invention. The references suggest the claimed ceramic and process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/cmk/  
June 27, 2008

/C. Melissa Koslow/  
Primary Examiner  
Art Unit 1793